IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
EL PASO DIVISION

LEAGUE OF UNITED LATIN AMERICAN CITIZENS, Plaintiffs, **GREG ABBOTT, et al.**, Defendants.	Case No. 3:21-cv-00259 [Lead Case]

SUPPLEMENTAL EXPERT REPLY OF SEAN P. TRENDE, Ph.D.

Table of Contents

List of Figures

Pursuant to this Court's 3/19/2025 Scheduling Order, as modified with an extension of time agreed to by the parties, I am submitting the following Supplemental Expert Reply. This report reponds to the Second Supplemental Report of Dr. Stephen Ansolabehere ("Ansolabehere Report"), the Third Supplemental Expert Report of Dr. Maria Cristina Morales April 14, 2025 ("Morales Report"), the Declaration and Report of Dr. Tye Rush ("Rush Report"), and the Second Supplemental Report: Overcoming the Presumption of Good Faith in Texas Congressional Redistricting of Howard Henderson ("Henderson Report"). All opinions are offered to a reasonable degree of certainty typical of the social sciences. My compensation of $450 per hour is in no way dependent on the substance of my conclusions. In forming these opinions, I relied upon the accompanying code and data referenced in my code, as well as the reports of the experts and their backup data. To the extent not provided by plaintiffs' experts, block assignment files were obtained from the Texas Legislative Council. These data are located at `https://data.capitol.texas.gov/`.

1 Response to Ansolabehere Report

Dr. Ansolabehere identifies three majority Hispanic CVAP districts in the Demonstration maps that he offers: District 12 in the Dallas-Fort Worth area, and districts 29 and 38 in the Houston area.

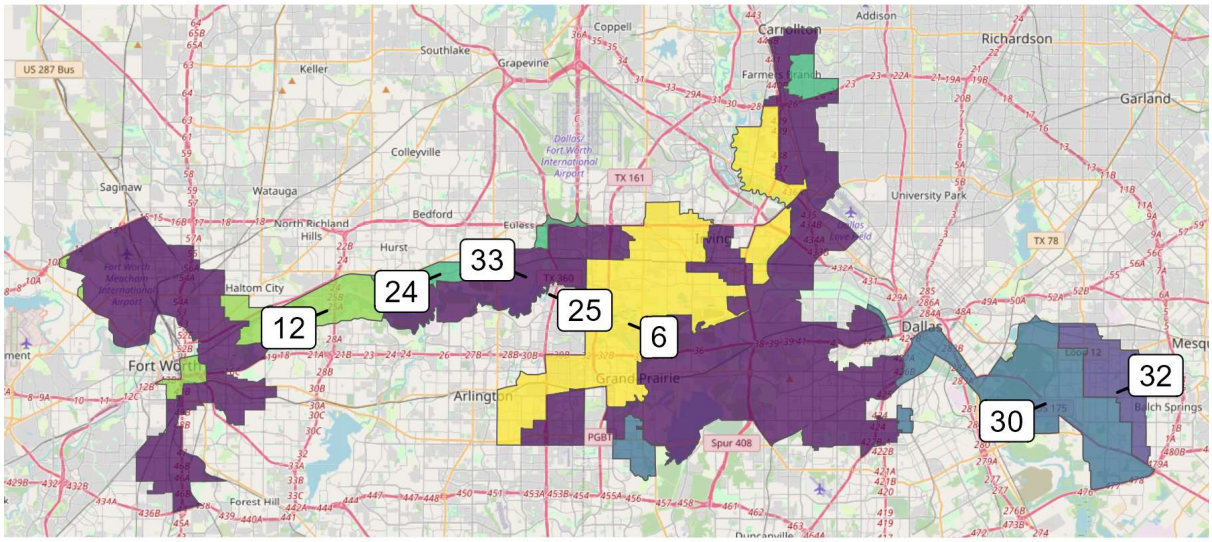
Dr. Ansolabehere also offers data on election results over the course of the past decade in his demonstration districts, suggesting that, under the Enacted Map, Districts 30, 32, and 33 in the Dallas area, and Districts 7, 9, 18, and 29 will tend to vote for the Democratic candidate of choice. *See* Ansolabehere Report, at Table 6, page 14.

Taking this as true, Dr. Ansolabehere's report demonstrates that most of the residents of his newly configured districts already reside in districts under the Enacted Maps where they are able to elect their candidates of choice.

A map of District 12, which extends across the Dallas-Ft. Worth metroplex is provided below. The district is shaded according to which district in the Enacted Map

an area is assigned.

Figure 1: Ansolabehere District 12, Shaded By Enacted Map



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As you can see, the district is made up of various (often non-contiguous) parts of districts 6, 12, 24, 25, 30, 32 and 33. The Voting Age Populations of these "chunks" are provided below. The final column provides the percentage of the HVAP for Demonstration District 12 that resides in a given district under the Enacted Map.[1]

[1]I do not rely on CVAP data here because at this level of granularity they are often marked by substantial error margins, which reduces the reliability of the point estimate; moreover, since CVAP data aren't provided at the block level, those numbers must be estimated as well when multiple block groups are split, as here. Error margins are not calculable for those block-level data. To the extent the Court is interested in these estimates, I have used Dave's Redistricting App to calculate them. 82% of the Hispanic CVAP in Demonstration District 12 resides in Enacted District 30, 32 or 33.

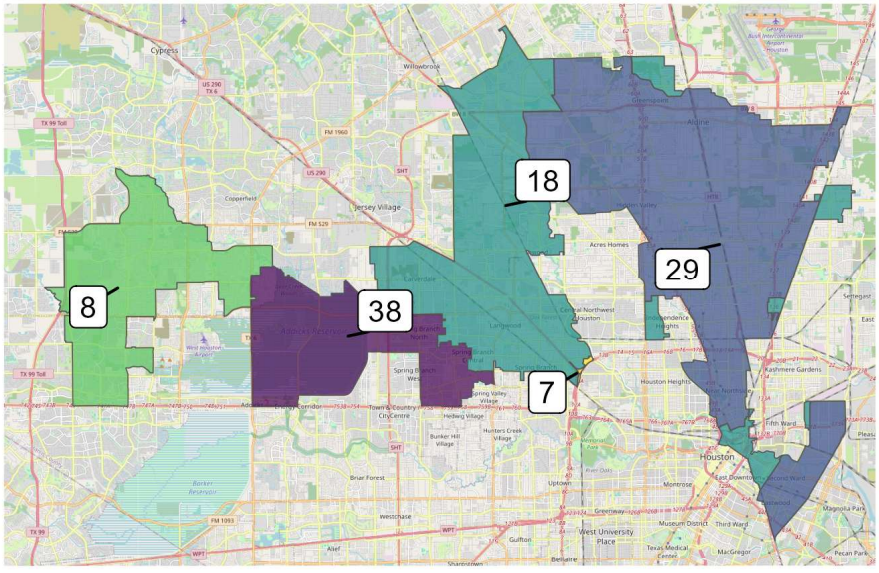
Figure 2: VAP of Segments of Ansolabehere District 12, by Enacted District

Enacted	Total	VAP	Hispanic VAP	% of Demon. District 12 HVAP
6	141,772	102,849	61,742	16.8%
12	21,364	15,857	4,678	1.3%
24	13,170	10,175	3,790	1.0%
25	0	0	0	0.0%
30	90,883	64,125	42,943	11.7%
32	56,242	39,147	25,855	7.0%
33	443,556	319,338	228,070	62.1%

Overall, 81% of the Hispanic Voting Age Population in District 12 resides in either District 30, District 32, or District 33. These districts, according to Dr. Ansolabehere's data, vote for the Democratic candidate of choice under the Enacted Map.

Turning to Houston, Dr. Ansolabehere's District 29 is comprised of portions of Enacted Map districts 7, 8, 18, 29 and 38.

Figure 3: Ansolabehere District 29, Shaded By Enacted Map



The Voting Age Populations of these "chunks" are provided below.

Figure 4: VAP of Segments of Ansolabehere District 29, by Enacted District

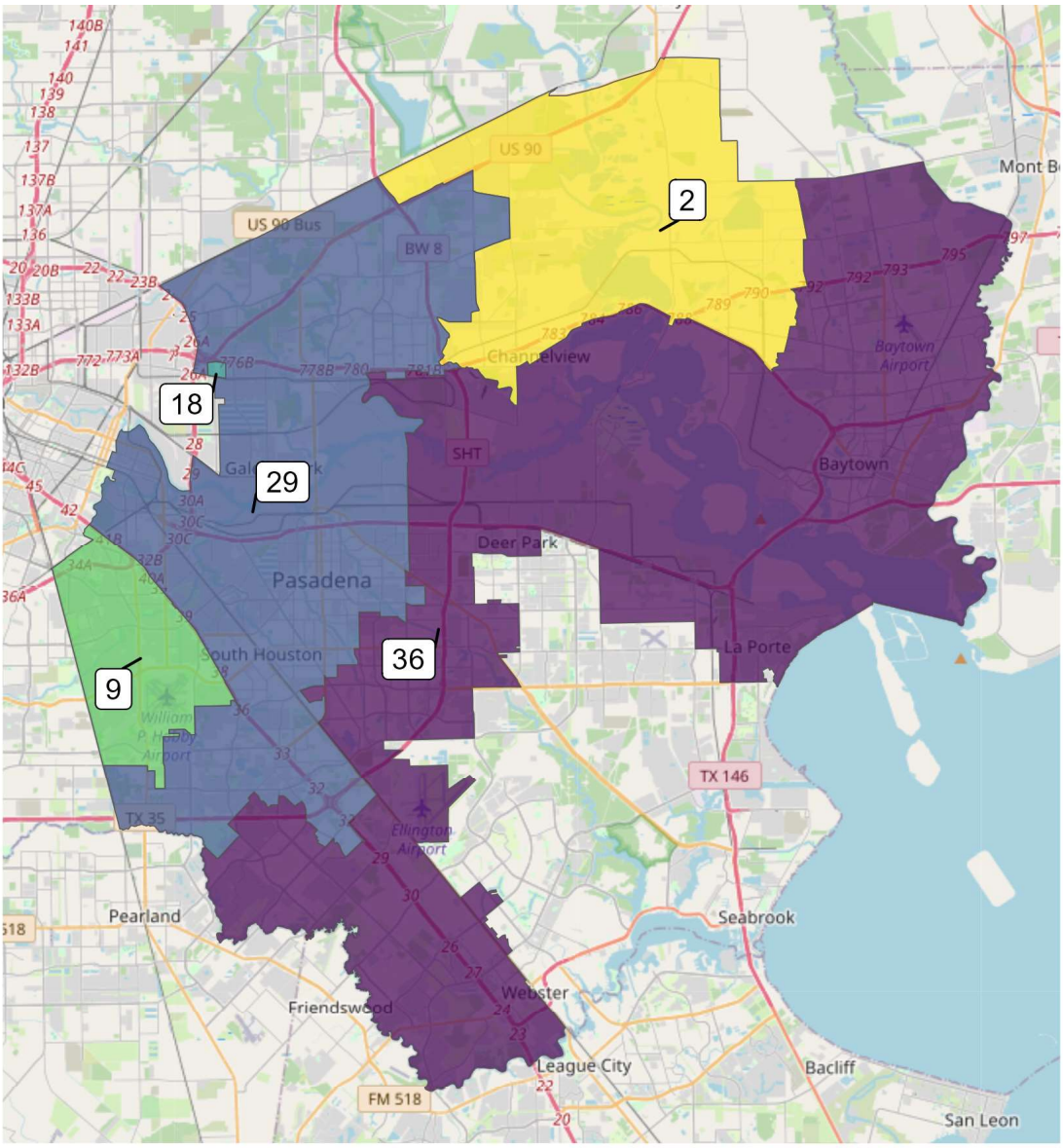
Enacted	Total	VAP	hispanic	% of Demon. District 29 HVAP
7	23	7	4	0.0%
8	171,826	121,590	59,983	17.3%
18	235,821	174,625	98,661	28.5%
29	309,517	221,952	169,370	48.9%
38	49,800	37,436	18,647	5.4%

Overall, 77% of the Hispanic Voting Age Population in Demonstration District 29 resides in either District 7, District 18, or District 29. These districts, according to Dr. Ansolabehere's data, vote for the Democratic candidate of choice under the Enacted Map.[2]

Finally, Dr. Ansolabehere's District 38 is comprised of portions of Enacted Map districts 2, 9, 18, 29 and 36.

[2]To the extent the Court is interested in estimated CVAP data, 77% of the Hispanic CVAP of District 29 resides in Enacted District 7, 18 or 29.

Figure 5: Ansolabehere District 38, Shaded By Enacted Map



Overall, 62% of the Hispanic Voting Age Population in Demonstration District 38 resides in either District 9, District 18 or District 29.[3] These districts, according to Dr. Ansolabehere's data, vote for the Democratic candidate of choice under the Enacted Map.

[3]The CVAP estimate for this value would be 64%.

Figure 6: VAP of Segments of Ansolabehere District 38, by Enacted District

Enacted	Total	VAP	Hispanic VAP	% of Demon. District 38 HVAP
2	56,419	39,289	21,774	6.4%
9	56,435	41,376	28,746	8.5%
18	232	213	28	0.0%
29	368,406	263,731	193,773	57.3%
36	285,495	211,449	93,877	27.8%

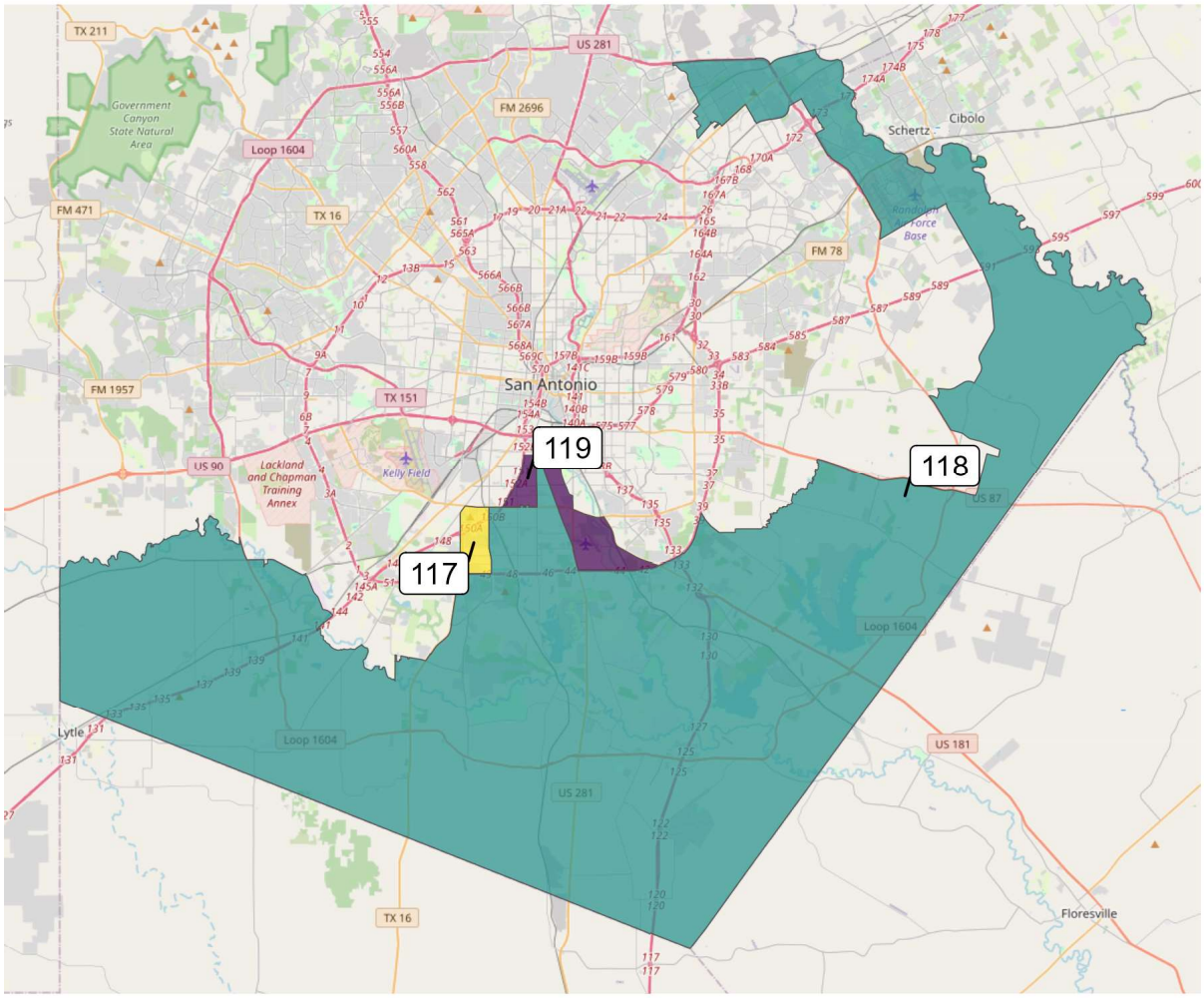
2 Response to Rush Report

Dr. Rush's report proceeds in much the same vein as Dr. Ansolabehere's Report, although it does involve some additional considerations. Dr. Rush first examines Map C2163. As a threshold matter, it is difficult to know exactly what to respond to, since Dr. Rush only offers vague descriptions of matters to which he will testify at trial. Regardless, he first focuses upon CD 37 in the Dallas area and CDs 29 and 38 in the Houston area. There is no further discussion needed here, as his districts are identical (aside from the numbering of the Dallas-area district) to the Ansolabehere districts discussed above.

Likewise, Map C2167 is not appreciably different from the Ansolabehere districts. District 29 is identical in both maps, while District 38 removes 8 census blocks from the Ansolabehere map (contained in Enacted District 36) and replaces them with census blocks from Ansolabehere District 14 (contained in Enacted District 36). The analysis does not change.

As to H2176, Dr. Rush primarily discusses District 118. This is a bit confusing, and I reserve my right to update my report pending further developments here. But District 118 is similar to District 118 in the Enacted Map.

Figure 7: H2176 District 118, Shaded By Enacted Map



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A total of 28,494 residents of voting age, 19,058 of whom are Hispanic, are moved into the district, while a total of 31,913 residents of voting age, 10,467 of whom are Hispanic, are moved out of the district. The CVAP of the district increases from 58.7%, using 2022 data from Dave's Redistricting, to 65.3% using the same data, but the District is majority CVAP to begin with.

Using the data provided in Dr. Rush's backup, the district remains competitive.

The 2024 results were a mixture of wins for Republicans and Democrats, with almost all of the races decided by a margin of two points or less. Using data from Dave's Redistricting, President Biden received 50.6% of the vote in Enacted District 118, while he received 53.6% of the vote in the H2176 version. In 2022, Democrats won the six races I explored in my first Supplemental report (Governor, Lt. Governor, AG, Ag. Commissioner, Comptroller and Land Commissioner) in H2176 District 118, but in the Enacted Map they won the Governor, Attorney General and Agricultural Commissioner races, while no party won more than 52% of the two-party vote in any of those races. In other words, H2176 simply increases the Hispanic citizen voting age population in an already majority-Hispanic district, and makes a district where Hispanic candidates of choice can win about three points more Democratic.[4]

Dr. Rush's "in-out" analysis is likewise confusing. These types of analysis are typically employed in intent analyses for racial gerrymandering claims. But Dr. Rush does not appear to be exploring racial intent with this analysis. Instead, he simply seems to explore the effect of these changes on spanish surname turnout. To the extent that he develops this into a racial gerrymandering analysis, either in a deposition or at trial, I reserve my right to respond further to this analysis.

3 Response to Morales Report

While Dr. Morales' first supplemental report was simply an elaboration on the socioeconomic status of existing districts, on the morning of Tuesday, April 15, I received an additional expert report from Dr. Morales, which appears to explore additional demonstration districts. In particular, she describes a new HD 129, CD 27, and SD 25. I respond to those here.

[4]The change in Democratic vote share across 2022 races from the Enacted Map to H2176 is almost shockingly consistent: 2.95% for governor, 2.77% for Lieutenant Governor, 2.82% from Attorney General, 2.98% for Ag. Commissioner, 3.12% for Comptroller, 3.07% for Land Commissioner.

3.1 It is unclear whether Congressional District 27 and Senate District 25 are majority CVAP.

[5]

As a threshold matter, the reports run by the Texas Legislative Council suggest that two of the demonstration districts may not be majority HCVAP due to the accompanying error margins. The HCVAP of SD 25 is reported as 50.1%, ± 0.9%. `https://data.capitol.texas.gov/dataset/0848a2d4-fe6b-42e2-8376-0876c383039d/resource/f960656a-c7a6-4ba9-976a-8b192c255b8c/download/plans2180r116.pdf`. The HCVAP of CD 27 is reported as 50.3%, ± 0.9%. In other words, in both instances the confidence intervals include 50%. I do not opine on the legal consequences of this; I simply describe the findings.

To understand this, we must make clear that CVAP data are derived from the American Community Survey, or ACS. The ACS is designed to "provide communities with reliable and timely social, economic, housing, and demographic data every year." United States Census Bureau, *Understanding and Using American Community Survey Data: What all Data Users Need to Know* 1, available at `https://www.census.gov/content/dam/Census/library/publications/2020/acs/acs_general_handbook_2020_ch01.pdf` (hereinafter "ACS Handbook"). It samples about 3.5 million individuals nationwide annually. *Id.* Unlike the decennial census, these numbers are not collected at a single point in time. *Id.* Rather, they are collected over the course of the year.

The census publishes the results of the ACS on an annual basis, called the "one-year estimates," but it only does so for geographies that contain more than 65,000 individuals. *Id.* Data are made available for smaller geographies in what are called five-year estimates, because they group together responses across a 60-month time period. *Id.* at 1. In other words, the interviews for the 2020 five-year estimates are *not* mostly conducted in 2020. Rather, they are spread across 2016, 2017, 2018, 2019, and 2020 and they "do

[5] Although these districts are not discussed in the Morales Report, this analysis applies to House Demonstration Districts 44 and 90

not describe any specific day, month, or year within that time period." *Id.* at 13. Put differently, as of today, the 2020 estimates contain data that are close to a decade old; the average data was likely collected sometime in 2018. Data at the block group level is only available in the 5-year estimates. Unlike the decennial census, which records precise information down to the census block level, the block group is the smallest level to which ACS data are reported. *Id.* at 12.

The census also produces a special tabulation to the ACS, which contains the "Citizen Voting Age Population by Race and Ethnicity" data. Because the United States Census Bureau was not permitted to include a question on citizenship on the decennial census, see *Department of Commerce v. New York*, 588 U.S. ___ (2019), we do not have the exact numbers reported by the United States Census Bureau upon which to rely. Instead, we must rely upon the results drawn from a sample. These estimates are broken down as far as the block group level and describe the estimated number of residents of each geographic region who are citizens. The estimates are further broken down by race and ethnicity. This special tabulation is what the CVAP estimates used in the various expert reports here are based upon.

One consequence of this is that CVAP data are accompanied by error margins. If you have ever heard a political poll reported, you have probably heard that the result has Candidate A leading Candidate B in a poll "with an error margin of +/- 3.5%" or some such. You've also probably heard a race called "within the error margin," as shorthand for "we can't really say whether Candidate A is really ahead of Candidate B." What this means in more precise statistical terms is explained below, but for our purposes here, it is enough to say that (a) because the ACS is based upon a sample, it also comes with error margins and (b) those error margins mean that the topline numbers, or "point estimates," have real uncertainty surrounding them that can complicate comparisons to other numbers. The Census Bureau explains:

> The data in American Community Survey (ACS) products are estimates of the actual figures that would have been obtained if the entire population—rather

> than the chosen ACS sample—had been interviewed using the same methodology. All estimates produced from sample surveys have uncertainty associated with them as a result of being based on a sample of the population rather than the full population. This uncertainty—called sampling error—means that *estimates derived from the ACS will likely differ from the values that would have been obtained if the entire population had been included in the survey*, as well as from values that would have been obtained had a different set of sample units been selected for the survey.

ACS Handbook at 53 (emphasis added).

Sampling error is something that is inherent in all surveying. It grows out of the math surrounding the uncertainty inherent in talking with a sample of the overall population (as opposed to talking to everyone, which is a census rather than a sample). Put differently, if the world's greatest pollster conducts a poll of 475 people showing a presidential job approval of 50%, it will have an error margin of +/- 4.5%. If the world's worst pollster conducts a poll of 475 people showing a presidential job approval of 50%, it will also have an error margin of roughly 4.5%.[6] In general, the larger the sample, the smaller the level of sampling error.

Unlike social science (and public polling), which typically reports results with a 95% degree of confidence, the ACS reports 90% confidence intervals. A 90% confidence interval means that we expect the true population value of a given estimate to fall into a reported confidence interval nine times out of ten. *Id.* So, for example, if a poll estimates President Donald Trump's job approval at 45%, with an error margin at 90% confidence of +/- 4%, the 90% confidence interval would be 41% to 49%. In nine polls out of ten, that confidence interval would have the true value in it somewhere. Critically, we don't know where in the confidence interval the true population value falls (if indeed it does) or if this is the one time out of ten that the true population value falls outside of the

[6]Note that there are other types of error associated with polling, such as errors that come from not sampling a representative sample of the population or groups of persons refusing to take a poll, but those are in addition to sampling error, not a part of sampling error.

confidence interval. We just know that as we keep taking polls, our population value will fall within the confidence interval one time out of ten.

The 90% confidence intervals reported by the census can easily be transformed into more traditional 95% confidence intervals by determining the standard error through a process described on page 55 of the ACS handbook, and then multiplying by the appropriate "z-statistic." For a 95% confidence interval, the z-statistic would be 1.96.

Confidence intervals exist whether or not they are acknowledged. The importance of acknowledging them, however, can depend on the application. For example, if I casually mention in writing that President Biden's job approval in a poll is 43% to suggest that he is unpopular, and it doesn't really matter if it is 44% or 42% in the general population, I might not mention the error margins. Of course, people also often simply forget about them. If, however, you are attempting a direct comparison to a specific value—say, Joe Biden's job approval is under 50%–it's important to take the uncertainty inherent in sampling into account. The confidence intervals likewise don't disappear just because a researcher forgets them.

The ACS is emphatic about this. On the first page of the ACS Handbook, it sets aside a special box that reads "TIP: In general, data users should be careful in drawing conclusions about small differences between two ACS estimates because they may not be statistically different." *ACS Handbook*, at 1. On page 17, it clarifies that "ACS data users interested in making comparisons also need to pay attention to sampling error because differences between estimates may, or may not, be statistically significant." *Id.* at 17. This is to show "whether the observed difference between estimates likely represents a true difference that exists within the full population (is statistically significant) or instead has occurred by chance because of sampling (is not statistically significant)." *Id.* at 55.

We can do this via confidence intervals or a hypothesis test, which are ultimately different forms of the same exercise. With a confidence interval, the idea is simple: If the desired comparator falls within the confidence interval, then we lack evidence to disclaim the possibility that the point estimate is the same as the compared value. In other words,

if the point estimate is 51%, and the 95% error margin is +/- 3%, then we wouldn't have sufficient evidence to disclaim the possibility that the true population value was, say, 49%. Let's say, however, that 47% were important for some reason. Given that 47% falls outside our confidence interval, we would say that if the true population value were 47%, it would be highly unlikely that we'd conduct our poll and produce a result of 51%. We'd therefore disclaim or reject the possibility that the true value in the population is 47%.

Note that we can't *rule out* the possibility that Biden's actual job approval in the broader population is 47%. It is just that producing a poll with a 51% result if the true population were 47% is sufficiently unlikely, given the standards of modern social science, that we would reject the possibility.

The other way that we can interpret a poll is with a traditional hypothesis test, or p-value. The p-value tells us the probability that we would see a result as extreme or more extreme than the sample result we observe if the opposite of our hypothesis were true. Traditional social science demands a p-value of lower than 0.05, which corresponds to 95% confidence. Results are sometimes published with p-values approaching 0.1, which corresponds to 90% confidence. It would be rare for results to be published with p-values greater than 0.1 Note that in truth confidence intervals and p-values measure the same thing; if a value falls within the 95% confidence intervals, the p-value will be larger than 0.05. One respected statistics text explains this way: "Typically researchers use the following scale:

p-value < 0.01: very strong evidence against H_0

0.01- 0.05: strong evidence against H_0[7]

0.05 – 0.1: weak evidence against H_0

[7] H_0 is how we denote the "null hypothesis," or the opposite of our hypothesis. Let's say our hypothesis is that "the Black CVAP of the district is higher than 50%." The null hypothesis would be that "the Black CVAP of the district is not higher than 50%." Using this standard, a p-value of greater than 0.1 would be considered "little or no evidence against this null hypothesis." In other words, the ACS data would reflect little or no evidence against a claim that the Black CVAP of the district is not higher than 50%. Because we lack sufficient evidence against that opinion, we would not rule it out, and would not, using standards typical of the social sciences, be able to claim that the Black CVAP of the district was above 50%. Because p-values and confidence intervals measure the same thing, we could also say that a value that falls within a 90% confidence interval has a p-value in excess of 0.1.

>0.1: little or no evidence against H_0

Larry Wasserman, *All of Statistics: A Concise Course in Statistical Inference* 156-157 (2004) (footnote added).

One critical thing to understand here: Classical statistical inference works in a counterintuitive manner. To put it in trial terms, it is not "the fact that we see X, Y and Z makes it clear that the accused is guilty." We never make statements directly about the probability of an outcome in classical statistics. Instead, we operate on the basis of an argument about the chances of getting the type of evidence we observe if our theory were not true.

In other words, the logic proceeds along the lines that "if the accused were innocent, he wouldn't have done X, Y and Z. It's just too unlikely that we'd get this type of evidence if he were innocent, so you must find him guilty." In other words, if the theory is "the CVAP in this district is above 50%" we ask ourself "If the CVAP were at or below 50%, how likely is it that we would have obtained this poll result.[8] If it's extremely unlikely, we would reject a suggestion that the CVAP were at or below 50%. If, however, obtaining a sample showing a given CVAP is something that could easily occur through the vagaries of sampling, we wouldn't reject the suggestion that the CVAP were at or below 50%.

Remember, in classical statistics – which is the approach that the Census Bureau discusses using in its *Handbook* – we never make direct statements about the likelihood or probability that the hypothesis is true; a p-value of 0.2, for example, does not mean that the hypothesis has an 80% likelihood of being true. It's a statement about the probability of receiving the data assuming the hypothesis is false. In other words, it is more about the

[8]It is true that the point estimate is the "maximum likelihood estimate," or MLE. It can be thought of as a "best guess" of the data. There are two important caveats. First, the "best guess" is not the same as "more likely than not." Second, it is still a statement about the likelihood of the data, rather than the actual value of our parameter. See Wasserman at 122-24. This is almost a truism: What's the most likely population value that would bring about a poll result of 51%? The most likely population value to produce that poll result would be 51%. That still, however, doesn't tell us much about the probability that the true population value is 51% as many other population values can easily lead to a point estimate of 51%; that uncertainty is what the confidence interval is for

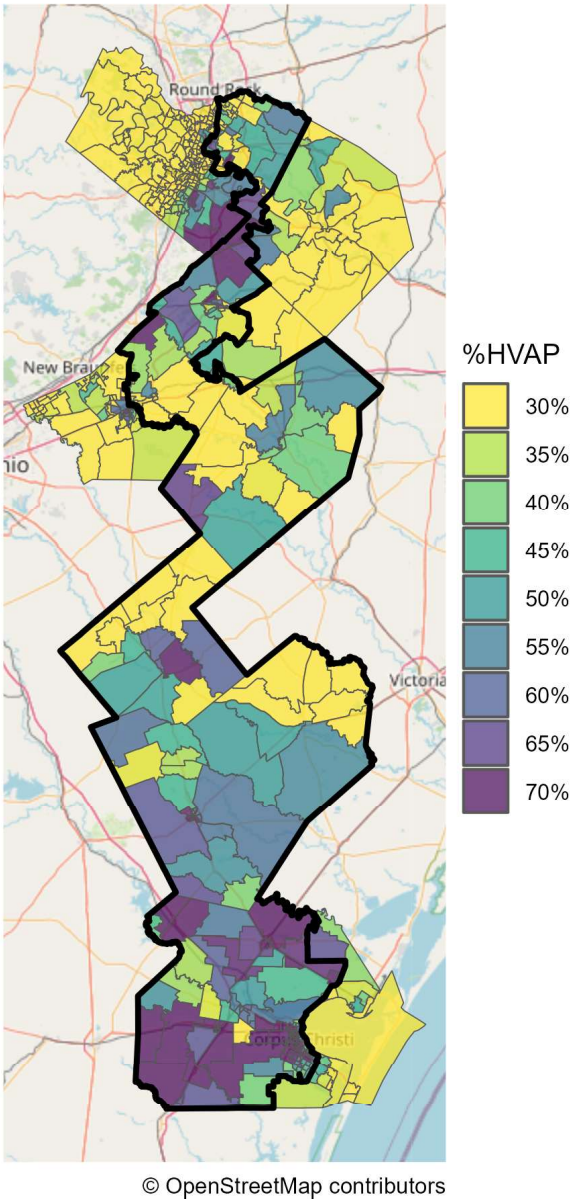
reliability of the evidence itself and whether it comports with social scientific standards.

The upshot of this longwinded discussion is this: Because the confidence intervals accompanying these ACS estimates include 50%, as social scientists we would not typically be able to say with sufficient certainty that the Hispanic CVAP of these districts is, in fact, above 50%. Put differently, because p-values are almost always reported at 0.05 or 0.1 in social sciences, reflecting 95% and 90% confidence, respectively, we would not be able to support the claim made here.

3.2 Congressional District 27

In addition to the above issues, Congressional District 27 appears to be an amalgamation of distinct Hispanic populations in multiple metropolitan areas, separated by heavily White, rural and suburban areas of Texas. I discussed this issue in more detail in my initial report in this matter and incorporate my discussion, as well as my description of choropleth maps, from there.

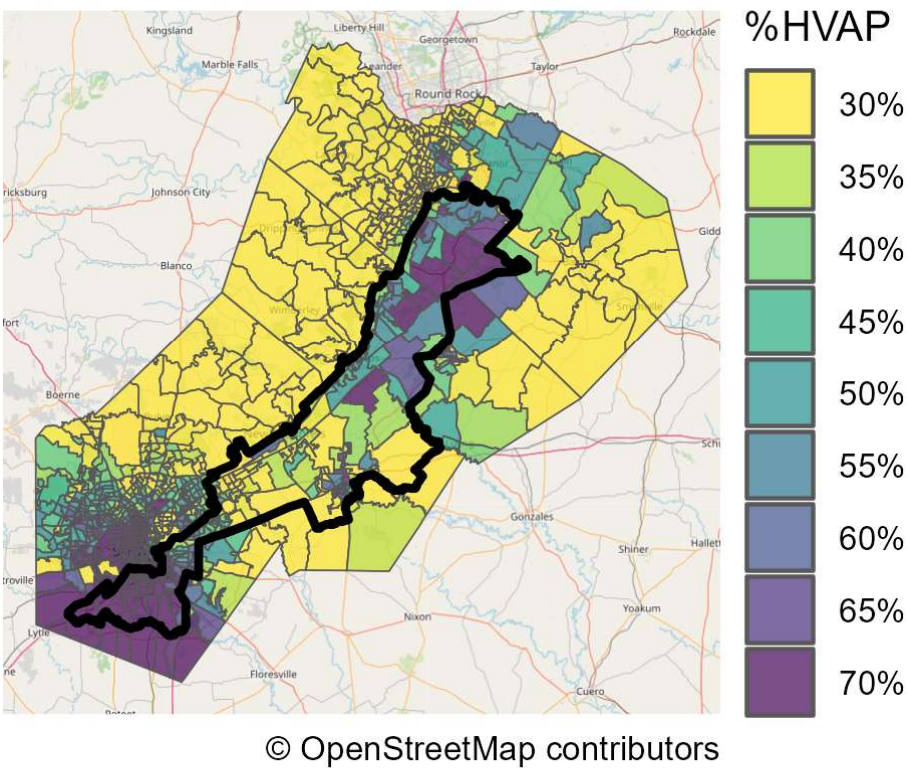
Figure 8: Demonstrative Congressional District 27



3.3 Senate District 25

Demonstrative Senate District 25 has a barbell shape, pairing a Hispanic population in Austin with a Hispanic population in South San Antonio. While this may be similar to the configuration of the existing Congressional Map, recall from my initial report that that map reflects an attempt to heavily gerrymander the region politically.

Figure 9: Demonstrative Senate District 25



In addition, this district likewise consists mostly of pieces of districts that already elect the Democratic candidate of choice. The following table examines the performance of Democratic candidates in districts contained in part in Demonstration District 25. With the exception of the existing districts numbered 5 and 25, all of the districts support Democratic candidates of choice, typically by strong margins.

Figure 10: 2022 Democratic Performance, Enacted Districts Contained within Senate Demonstrative 25

Enacted	Governor	Lt. Gov.	AG	Ag. Sec	Comp	Land Comm
5	61.7%	61.2%	61.1%	62.5%	63.9%	63.1%
14	22.7%	22.1%	21.3%	24.2%	26.5%	24.9%
19	44.5%	45.5%	44.5%	45.0%	46.7%	45.8%
21	41.3%	41.5%	39.8%	40.8%	42.6%	41.8%
25	60.9%	60.7%	60.3%	61.7%	64.2%	62.6%
26	33.8%	34.5%	33.8%	34.5%	36.3%	35.2%

At the same time, the Hispanic population of Enacted District 25 contained in Demonstration District 25 is relatively small. The overwhelming majority of the population of this district is already represented by Democrats in the State Senate.

Figure 11: HVAP of Segments of Morales Senate District 25, by Enacted District

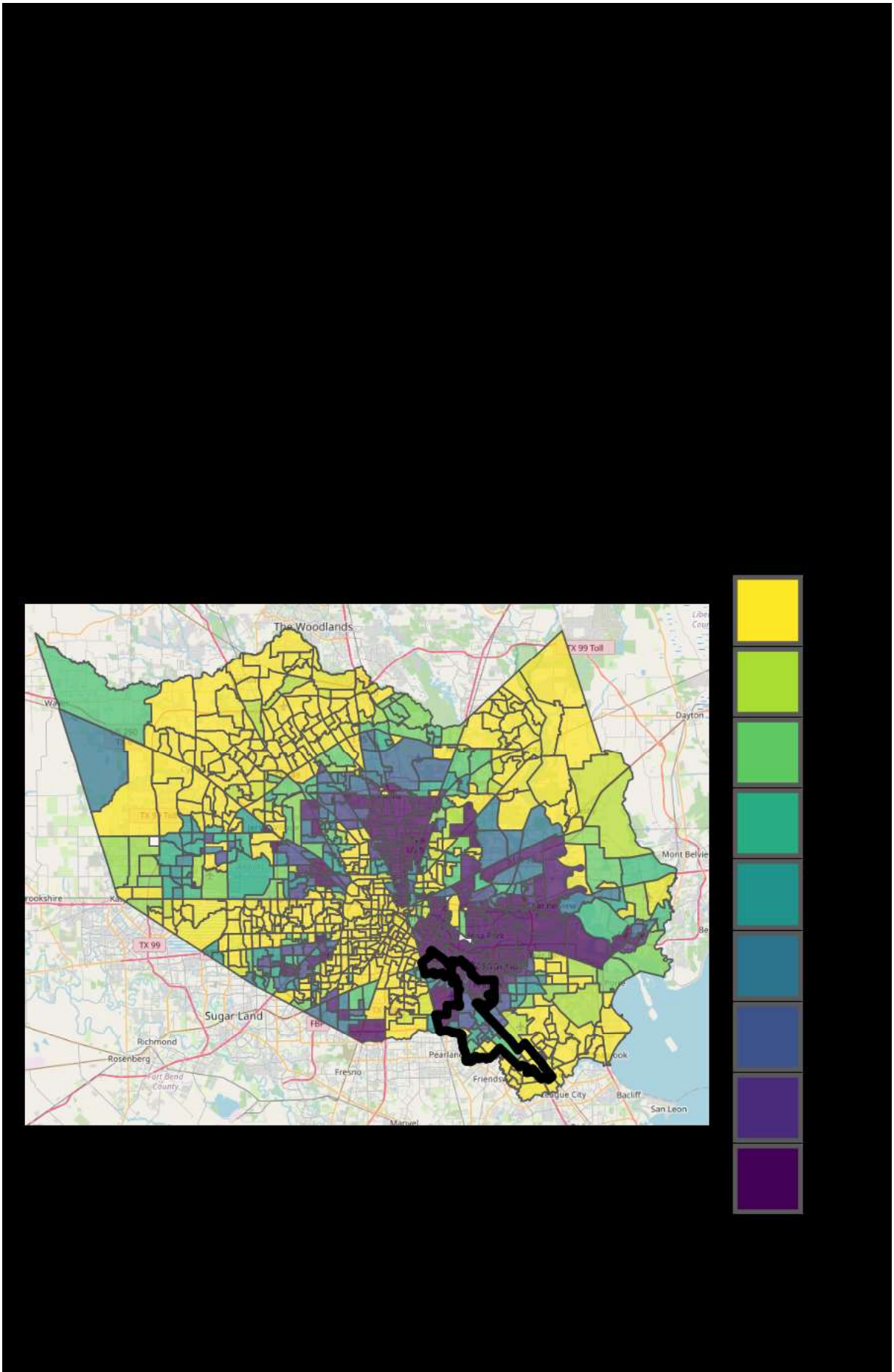
Enacted	VAP	HVAP	% of Demon. District 25 HVAP
5	6,811	5,174	1.4%
14	29,275	13,793	3.7%
19	254,233	170,277	45.9%
21	230,689	122,519	33.0%
25	127,145	41,902	11.3%
26	31,088	17,085	4.6%

Finally, it is worth noting that Senate District 14 currently elects a Democrat to the Senate as well (from Austin) and obviously performs very strongly for Democrats. That district is not drawn on the demonstration map, to my understanding. However, the Demonstration map takes 37,640 residents from District 14 and places them in District 25, while another 268,950 residents are placed into District 21. While the remaining precincts previously contained in District 14 are still heavily Democratic, it is unclear whether a Democratic district would remain, and whether this map actually increases the number of districts in the area that will elect a minority candidate of choice.

3.4 House District 129

Finally, House District 129 does appear to reflect a compact minority population that is in excess of 50% HCVAP.

Figure 12: Demonstration House District 129



However, as with other districts here, the overwhelming majority of the population of this district is already represented by the Hispanic candidate of choice. With the exception of the district already labelled 129, all of these districts vote for Democrats and elect Democrats to the state House.

Figure 13: HVAP of Segments of Morales House District 129, by Enacted District

Enacted	Governor	Lt. Gov.	AG	Ag. Sec	Comp	Land Comm
129	57.8%	57.4%	57.7%	59.2%	60.5%	60.4%
131	19.0%	19.3%	19.1%	19.5%	20.1%	20.1%
144	44.1%	45.2%	44.2%	45.2%	46.7%	46.7%
145	27.8%	27.9%	27.6%	30.7%	31.9%	31.5%
147	19.3%	19.4%	19.2%	21.1%	21.5%	21.5%

And yet, very little of the Hispanic population of this district is taken out of district 129. A solid majority of the Hispanic Voting Age Population (and the overall population) is taken from Enacted Districts 144, 145, and 147.

Figure 14: HVAP of Segments of Morales House District 129, by Enacted District

Enacted	VAP	HVAP	% of Demon. District 129 HVAP
129	31,416	10,846	12.5%
131	5,751	3,469	4.0%
144	50,069	33,781	38.9%
145	22,755	18,562	21.4%
147	33,178	20,145	23.2%

4 Response to Henderson Report

The Henderson Report purports to demonstrate that there are indicia of racial gerrymandering in Texas by conducting multivariate regression analysis. It is difficult to know precisely how Dr. Henderson has proceeded, because there is no backup data or computer code offered with his report. To the extent that data is ever proffered, I reserve my right to update this report accordingly.

Dr. Henderson first notes that substantial Black populations were moved into and out of districts in the Dallas/Ft. Worth and Houston areas, beyond what is needed to satisfy one-person-one-vote requirements. Henderson Report, at 2. Second, he finds that a disproportionate share of Black voters were moved, vis-a-vis Whites, and that Black voters had higher variability and different rates of disruption at different points. Finally, he conducts a multivariate regression that finds stronger effects for race than politics. *Id.* 2-3.

None of this demonstrates that race predominated. There are a few straightforward reasons for this. First, the only analysis that attempts to disentangle race from politics is the regression analysis, to which I will respond later. That Blacks have different rates of movement than Whites is perfectly consistent with a political gerrymander. After all, the ecological inference analyses I have reviewed suggest that, in Texas, Black voters and White voters frequently prefer candidates of different parties. Moreover, they do so at different rates, with Black voters preferring Democrats, generally, at higher rates than White voters prefer Republicans. *See, e.g.*, Moon Duchin Report, "Race and Redistricting in Texas," May 20, 2022, at 29 (finding that, in Tarrant and Dallas counties, Black Voters supported Democratic candidates with approximately 95% of the vote, while Whites supported Republicans with around 58% of the vote).

Second, and perhaps most importantly, this analysis does not take account of space. It assumes, without any justification, that the null distribution – the universe of maps that one would select from if one drew maps without regard to race – would show

racial groups moved in roughly uniform ways. But that is usually only the case if racial groups are spread out evenly. We know, however, from multiple examples in this case that this is not true; racial groups are frequently clustered together. Thus, if a racial group clusters toward the edges of an area, they're more likely to be shifted than if they are not clustered toward the edges of an area. This is why most of the expert analysis of racial gerrymandering either involves simulations (as do the Duchin and Trende reports here), or a "county envelope" analysis, such as the type of analysis employed by Dr. Ansolabehere in earlier litigation in North Carolina. In short, it's simply not enough to state that different racial groups are moved at different rates from each other when exploring redistricting, at least without first demonstrating that such outcomes would be unusual in a world where we draw without respect to race.

In Table 1, Dr. Henderson reports that "New District VAP is significantly higher than Current VAP using alpha (α)= .05." Henderson Report, at 5. It is unclear exactly what he means by this. VAP is a known quantity; it is a census. There's no statistical uncertainty surrounding it. It is unclear how one would even conduct a statistical examination here, especially without any backup data or code.

On page 9, Dr. Henderson demonstrates that there is a statistically significant relationship between the VAP of a district in 2021 and in 2020, and that it is negative. This demonstrates how "statistically significant result" does not always equate to "interesting result." There were fewer congressional districts in 2020 than in 2021. One would naturally expect for voting age population in a district to be lower in 2021 than in 2020, since that population was spread over more districts in 2021 than it was in 2020.

Finally, Dr. Henderson's regression analysis does not disentangle race from politics in the redistricting process. Note first that he excludes Districts 37 and 38 from his analysis, notwithstanding that, in my initial report, I demonstrate that Districts 37 and 38 played pivotal roles in the political gerrymander. More importantly, his dependent variable in both of his models is the total VAP of the resulting district. This is the outcome he is trying to explain. At best, therefore, what he shows is that after controlling for

race, the voting age populations of districts tend to be negatively correlated with Black population and positively correlated with White population. Of course, even this is susceptible to multiple interpretations: if the Black or Hispanic population tended to be younger than the White population, this disparity could occur naturally. Note too that this is the voting age population, not the total population, which, of course, is even in congressional districts.

Even if this finding were of interest, his specifications of his predictor variables is likewise problematic. Rather than measuring partisanship via endogenous election outcomes (*e.g.*, Republican or Democratic vote share in some series of elections), as in most other expert reports in this litigation, Dr. Henderson appears simply to label a district "Republican" if it sends a Republican to Congress, or "Democratic" if it elects a Democrat.

Finally, even if all of the above were wrong, and Dr. Henderson's approach were valid, it still would not support his conclusion that "racial factors, not partisan or other considerations, drove redistricting decisions." All that a regression analysis can typically demonstrate is correlation: That as variable X increases, variable Y tends to increase or decrease. It doesn't prove that X causes Y. It could be that Y causes X, or that some unobserved factor Z drives both X and Y. To give an example of this: A farmer may note that every time his rooster crows, the sun rises shortly thereafter. The correlation there is extremely strong. Yet it is not the case that the rooster crowing causes the sun to rise; the relationship runs in reverse there. To the extent there's a meaningful relationship here, it is not demonstrated that it is a causal one.

I declare under penalty of perjury under the laws of the State of Ohio that the foregoing is true and correct to the best of my knowledge and belief. Executed on April 17, 2025 in Delaware, Ohio.

Sean P Trende

Sean P. Trende